Message

From: G D Beckett [g.d.beckett@aquiver.com]
Sent: 1/16/2018 4:05:16 PM
To: Grange, Gabrielle Fenix [Gabrielle.Grange@doh.hawaii.gov]; G D Beckett [g.d.beckett@aquiver.com]
Subject: Re: Next Steps?

Hi Fenix,

What I had started from my notes is a little detailed, and I had kind of intended it to go into sufficient depth that the Navy would have the details and specifics. I don't know if that's needed or not, but for the immediate needs, I can summarize the key issues.

1. The model does not consider dynamic processes, it is simply a storage compartment for LNAPL retention. Due to implementation assumptions and the limitations of the method itself, it results in a highly unrealistic and non-conservative representation of LNAPL migration. Also, actual historic g.w. impacts show the plume has spread in ways not considered by the Navy team. So the idea that millions of gallons could be released "safely" is absurd.

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2. A transient dynamic LNAPL model (implemented correctly) will show much more LNAPL movement and ultimate lateral distribution than the Navy model. Given the down-dip orientation along the RH ridge, that would carry LNAPL much closer to, and perhaps arriving at Red Hill shaft. With the sparse monitoring network, it is difficult to say how far past releases have migrated, but certainly much farther than the Navy model suggests.

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3. All model parameters are literature based, with nothing site specific. I suspect, though unconfirmed, that clinker zones will behave as non-uniform units, meaning that LNAPL residualization will be heterogeneous and not encounter the full pore volume of each zone. This is a critically important facet to considering the degree of potential residualization because it will cause much more significant migration and less buffering.

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4. The manner in which the Navy presented its questions of the model were non-compelling. A more holistic approach would ask the question more broadly and without the appearance of assuming a conclusion ahead of the rigorous analysis. The question might be stated "For a range of plausible release scenarios placed within the site specific detailed geologic setting, what conditions impact groundwater and of those, which potentially impact known/existing receptors?"

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5. The Navy model, as noted above, ignores existing data and is not calibrated or even tuned in any way to be reflective of available data points. It makes assumptions that are totally unconfirmed. For instance, while temperature often indicates biodegradation activity, that activity slows as a function of electron acceptor depletion, source mass, and other aspects. So to conclude that the temperature profile of a sparse network indicates the LNAPL distribution is not a scientifically supported conclusion. Where temps are high, yes, likely LNAPL source nearby, but low temps in no way exclude the possible presence of LNAPL. In fact, the LNAPL impact indicators in g.w. demonstrate that this conclusion is erroneous, non-representative, and non-conservative.

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6. What to do? Use the geologic model to select 3 - 5 cross-sectional scenarios for a dynamic transient LNAPL flow model (MAGNAS, T2VOC, etc.). Develop a credible range of site specific release conditions to run in those models. Constrain the models with site-specific data on LNAPL retention, capillarity, aperture ranges, etc. Run bench &/or field scale infiltration testing using a benign LNAPL that matches general bulk transport properties of the JP fuels at the facility.

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All that said, it may be more powerful/persuasive if we run some estimates of our own so that we can show the Navy the flaws in their model, and can set a range of expectations of the results of the evaluations.

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-----Original Message-----
From: Grange, Gabrielle Fenix [mailto:Gabrielle.Grange@doh.hawaii.gov]

Sent: Monday, January 15, 2018 11:10 PM
To: 'G D Beckett'
Subject: Re: Next Steps?

11:30 call tomorrow with epa team. Lmk if you don't have link. We will be strategizing them. I may have time to talk briefly at 9 ish Yes. Lnapl mocking requires clear immediate response. Please draft succinct summary of our concerns and keys steps they need to take. Other key points and redirects are underway as well

Fenix Grange
Program Manager
Hazard Evaluation Emergency Response Office
808-586-4248

From: G D Beckett <g.d.beckett@aquiver.com>
Sent: Monday, January 15, 2018 1:15:53 PM
To: Grange, Gabrielle Fenix
Subject: Next Steps?

Hi Fenix,

What do we need to do in the near-term to keep our diligence on Red Hill going? I have more incoming information from Bob & Don, but don't want to get side tracked relative to your priorities. As you already know, I have a few concerns about the GSI LNAPL "modeling" approach.

Best regards.

G.D. Beckett, RG, CHg
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